Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority Sai Yee Street/ Flower Market Road Development Scheme ("YTM-013"), Mong Kok, Kowloon

Drainage Impact Assessment

(V1.0)

June 2026

Approved By _____

(Project Manager: K.S. Lee)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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1 INTRODUCTION

1.1 Background

1.1.1 The Urban Renewal Authority (URA) has proposed the Sai Yee Street / Flower Market Road Development Scheme (YTM-013) (the Scheme) under Section 25 of the Urban Renewal Authority Ordinance (URAO). The Chief Executive in Council (CE in C) approved the draft Development Scheme Plan (DSP) on April 8, 2025, and published this decision in the Government Gazette on 17th April 2025. The approved DSP No. S/K3/URA5/2 was exhibited for public inspection on the same day.

1.1.2 To optimize the utilization of the Scheme area and in view to the current unoptimistic office market sentiment with a high office vacancy rate and the Government's directive of suspending the sales of commercial sites, the URA proposes to increase the maximum domestic Gross Floor Area (GFA) to allow flexibility for future development to meet the market needs and enhance market attractiveness of the Scheme. A Section 16 planning application (S.16 Application) is proposed to seek for minor relaxation of domestic GFA in Sub-area (1) of Site B (the whole Site B as the Application Site), zoned as "OU(MU)2" from 46,605 m² (equivalent to a Domestic Plot Ratio (DPR) 6.5) to 53,775 m² (equivalent to a DPR 7.5), while keeping the total maximum GFA of Site B unchanged. The Application Site of the current S.16 Application will only cover Site B of the approved DSP. **Figure 1-1** shows the Application Site of the current S.16 Application.

1.1.3 This S.16 Application is a non-scheme-based submission. The notional design is prepared based on the proposed minor relaxation of the Approved DSP parameters. Under the non-scheme-based approach, the notional design and indicative development parameters provided are only for illustrative purposes and for conducting necessary technical assessments to demonstrate the impacts of the proposed minor relaxation. Except for any planning condition(s) to be imposed, the design of the future development will not be bounded by the notional design submitted in the S.16 Application.

1.1.4 Cinotech Consultants Limited has been commissioned by the URA to conduct a Drainage Impact Assessment (DIA) to support the submission of the S.16 Application to the Town Planning Board (TPB) for consideration.

2 DESCRIPTION OF THE ENVIRONMENT

2.1 Existing Environment

2.1.1 To demonstrate the complete picture of the future development in the urban context, the assessment will describe the Proposed Development of the whole DSP (i.e. both Site A and Site B) (the Scheme). The Scheme is located in the northeastern part of Mong Kok. With a total gross site area of 29,315m^2, the Scheme is divided into Site A (about 4,445m^2) and Site B (about 24,870m^2). The location of the Scheme is shown on **Figure 1-1**.

2.1.2 Site B of the Scheme (the Application Site) is currently occupied by various leisure, recreation and GIC facilities, including Boundary Sports Centre No.1 and No.2, Boundary Street Recreation Ground, Sai Yee Street Children's Playground, Boundary Street Amenity Plot, Boundary Street Sports Centres, Sai Yee Street (Flower Market Road) Refuse Collection Point, Sai Yee Street Public Toilet, Leisure and Cultural Services Department ("LCSD") Boundary Street Plant Nursery and CLP Power Hong Kong Limited Boundary Street Sports Ground Substation. In addition, Site B also includes the whole of Flower Market Path, which is a public footpath. There is no private lot within Site B.

2.1.3 Site A of the Scheme (not forming the Application Site) comprises five sub-areas, named Sites A1 to A5 respectively. All five sub-areas of Site A are currently occupied by low-rise residential/ composite buildings aged 60 and above.

2.2 The Proposed Development

Approved DSP and S.16 Application

2.2.1 According to the approved DSP of the Scheme, Site B, the Application Site, is zoned "Other Specified Uses (Mixed Uses) 2" ("OU(MU)2"), and is further divided into Sub-area (1) and Sub area (2). Sub-area (1) of Site B will be for a high-rise development with a maximum domestic gross floor area ("GFA") of 46,605m^2 and a total GFA of 64,530 m^2, as well as a building height restriction ("BHR") of 150mPD adopting a stepped height profile. Sub-area (2) of "OU(MU)2" zone comprises the Waterway Park and ancillary retail/ commercial uses and LCDS's sports/ GIC facilities with a BHR of 30mPD. It has a maximum non-domestic GFA of 8,955 m^2.

2.2.2 Site A (not forming the Application Site) is zoned "Other Specified Uses (Mixed Use) 1" ("OU(MU)1") and it consists of 5 Sub-areas – Sub-areas (1) to (5) (i.e. Sites A1 – A5). Site A1 will be developed for residential development cum commercial podium, with a BHR of 150mPD. Open space and 1-storey retail shops will be provided at Sites A2 to A5.

2.2.3 Under this minor relaxation application, the maximum domestic GFA of Sub-area (1) in Site B is proposed to increase from 46,605m^2 to approximately 53,775m^2, equivalent to an increase in DPR from 6.5 to 7.5 (see **Table 2-1**). The total GFA for Sub-area (1) remains at 64,530m^2 (PR = 9.0). The development parameters of Sub-area (2) of Site B remain the same as the under the previously endorsed DSP.

Comparison between the Approved DSP and Current S.16 Application Proposal (Site B)

2.2.4 A comparison between the development parameters of the approved DSP and that of the S.16 Application is provided in **Table 2-1** below.

Table 2-1 Comparison between the Approved DSP and the Current S.16 Application Proposal (Site B)

Development Parameters of Site B	Approved DSP [A]			Current S.16 Application [B]			Difference [B] – [A] (% change)
Zoning	OU(MU)2			OU(MU)2			N/A
Gross Site Area (m^2)	About 24,870			About 24,870			N/A
	Sub-area (1)	**Sub-area (2)**	**Total [A]**	**Sub-area (1)**	**Sub-area (2)**	**Total [B]**	
Net Site Area (m^2) (for PR Calculation) [1]	About 7,170	About 17,700	About 24,870	About 7,170	About 17,700	About 24,870	N/A
Maximum GFA							
-Total GFA (m^2)	64,530	8,955	73,485	64,530	8,955	73,485	N/A
-Domestic GFA (m^2)	46,605	N/A	46,605	**53,775**	N/A	**53,775**	**+15.4%**
Maximum Building Height (mPD)	150	30	N/A	150	30	N/A	N/A

Remark:
[1] Subject to site survey

Notional Design

2.2.5 A notional design, which is illustrated in **Appendix 2-1**, is prepared based on the development parameters to demonstrate the proposed planning intention and development concepts of the Scheme. Compared to the notional design for the approved DSP, the current notional design for S.16 Application has only revised the design of Site B, while keeping the notional design of other parts in the DSP unchanged from the approved DSP.

2.2.6 Regarding the Application Site, under the current notional design for Sub-area (1) of Site B (the north-east corner of Site B), a development featuring 3 high-rise developments, including 2 residential towers and 1 mixed-use composite tower with residential/ hotel uses, along with retail/ recreation and GIC facilities at the podium level, is proposed. Ancillary parking and a public vehicle park (PVP) are proposed in the basement levels of Site B. An at-grade open space, named "Waterway Park," is proposed in the Sub-area (2) of Site B. Ancillary retail facilities are planned at the ground level and the Waterway Park to enhance retail activities and vibrancy adjoining the existing Flower Market.

2.2.7 Compared to the approved Scheme for approved DSP, the major change is at Sub-area (1) of Site B, where the hotel/ office tower in the approved Scheme is changed to a composite tower of residential/ hotel tower, with the same height (130 mPD) in the current S.16 Application.

2.2.8 The notional design for Site A is the same as the approved DSP at planning stage and will be referenced for the purpose of technical assessments to support the S.16 Application. Site A1 is proposed to be developed into high-rise residential towers with retail podium, at-grade open space and basements for ancillary parking spaces and loading/ unloading bays. Sites A2-A5 are proposed to be developed into 1-storey retail blocks/ open space to create nodal points and continuation of retail frontages for the Flower Market.

2.2.9 The Proposed Development of the Scheme will be redeveloped in phases. Phased development and completion may be adopted by further sub-division of Site B, subject to liaison and agreement with relevant government departments at the implementation stage. The tentative completion year of the whole Scheme is in 2036.

Development Parameters of the Notional Design

2.2.10 The development parameters of the notional design of Site A shown in **Table 2-2** remains the same as those under the approved DSP. This assessment is prepared based on the development parameters in **Table 2-2 & Table 2-3** of the notional design, which are subject to changes at detailed design stage.

Table 2-2 Development Parameters of the Notion Design (Site A)

Site A	**A1**	**A2**	**A3**	**A4**	**A5**
Gross Site Area	About 3,570m^2	About 268m^2	About 123m^2	About 233m^2	About 251m^2
	About 4,445m^2				
Net Site Area (subject to survey)	About 2,640m^2	About 239m^2	About 109m^2	About 202m^2	About 198m^2
	About 3,388m^2				
Zoning	OU(MU)1				
Domestic GFA [1]	23,716m^2	-	-	-	-
Non-Domestic GFA [1]	6,576m^2	-	-	100m^2	100m^2
No. of Building Blocks [2]	2	-	-	1	1
Building Height	150mPD	-	-	1 storey	1 storey
No. of Flats [2]	474	-	-	-	-
Average Flat Size [2]	50m^2	-	-	-	-
At-grade Open Space	About 800m^2				

Note
[1] Under the proposed "OU(MU)" zoning, flexibility is allowed to interchange GFA of various compatible uses. The proposed GFA mix in the current notional design is indicative only and subject to changes in detailed design stage.
[2] Number of building blocks, number of flats and average flat size are indicative only and subject to detailed design.

Table 2-3 Development Parameters of the Notion Design (Site B – Application Site)

Site B			
Gross Site Area	About 24,870m^2		
Zoning	OU(MU)2		
	Sub-area (1)	**Sub-area (2)**	**Total**
Net Site Area (subject to survey)	7,170m^2	17,700m^2	24,870m^2
Domestic GFA [1]	53,775m^2	-	53,775m^2
Non-Domestic GFA [1] - Retail - Hotel	10,755m^2 (5,755m^2) (5,000m^2)	8,955m^2 (8,955m^2) -	19,710m^2 (14,710m^2) (5,000m^2)
GIC GFA (to be exempted from GFA calculation) [3]	30,000m^2		
No. of Building Blocks [2]	2 residential towers and 1 composite tower with residential and hotel uses on top of GIC/ recreation/ retail podia + 1 retail block		
Building Height	150mPD (residential towers) 130mPD (composite tower) 1 storey (retail block)		
No. of Flats [2]	About 1,080	-	About 1,080
Average Flat Size [2]	50m^2	-	50m^2
At-grade Open Space	About 8,800m^2		
Public Vehicle Park [4]	About 220 private car parking spaces + About 10 loading/unloading bays		

Note
[1] Under the proposed "OU(MU)" zoning, flexibility is allowed to interchange GFA of various compatible uses. The proposed GFA mix in the current notional design is indicative only and subject to changes in detailed design stage.
[2] Number of building blocks, number of flats and average flat size are indicative only and subject to detailed design.
[3] The actual GIC GFA is subject to liaison with Government departments. As a conservative approach, 30,000m^2 GIC GFA is assumed in this assessment.
[4] Subject to liaison with Transport Department.

2.2.10 Since there are no change to the catchment area and discharge locations compared to the approved DSP, the general approach in the approved DSP will be applicable to the current design, with minor adjustments to account for the increased rainfall intensity based on the updated maximum rainfall figures since the previous DIA report. Therefore, similar to the approved DSP, the existing stormwater discharge system for Sites A1 and B, including the discharge points, will be completely revamped. Additionally, certain existing stormwater pipes will be removed to accommodate development requirements. Consequently, provisions for diversion will be made, and a comprehensive assessment of the potential drainage impact resulting from the development of Sites A1 and B will be conducted, with appropriate measures implemented as necessary.

2.2.11 The peak stormwater discharge of Sites A2 (catchment S-A2), A3 (catchment S-A3), A4 (catchment S-A4) & A5 (catchment S-A5) are 25.5 L/s, 11.8 L/s, 22.0 L/s & 23.7 L/s respectively according to the calculation (**Appendix 3-1)**. Since these sites are served by the major stormwater pipes of 1275mm to 1500mm along Prince Edward Road West, which having capacity of ~2100 L/s and ~3250 L/s respectively when the slope is 1:300, the discharge from Sites A2 to A5 are small in comparison to the scale of the major stormwater pipes in their downstream vicinity.

3 DRAINAGE IMPACT ASSESSMENT

3.1 Methodology

3.1.1 As mentioned in **Section 2.1.1**, the assessment will take into account of the Proposed Development for both Site A and Site B under the notional design for a complete picture and its accumulated impacts to the existing drainage system.

3.1.2 Stormwater Drainage Manual – Planning, Design and Management", fifth edition, January 2018, (hereafter called "the SDM") prepared by Drainage Services Department (DSD) provides guidelines for the design of the drainage system. "Corrigendum No. 1/2022 of the Stormwater Drainage Manual" (hereafter called "SDM Corrigendum 1/2022"), has been made by the DSD in 2022 for updating the design requirement of rainfall increase and extreme sea level rise in 21st century. "Corrigendum No. 1/2024 of the Stormwater Drainage Manual" (hereafter called "SDM Corrigendum 1/2024"), has been made by the DSD in 2024 for updating the maximum rainfall intensity.

3.1.3 This report adopts the rational method for the assessment, where the peak runoff is estimated by runoff coefficient, rainfall intensity and catchment area as stated in Section 7.5.2 of the DSD Manual.

3.1.4 The adopted runoff coefficients are referred to Section 7.5.2(b) of the DSD Manual and summarized in **Table 3-1**.

Table 3-1 Runoff Coefficients

Type of Area	Run-off Coefficient [1]
Grass	0.19
Paved/Concrete	0.90

Note:
[1] The runoff coefficients are extracted from Section 7.5.2(b) of "Stormwater Drainage Manual – Planning, Design and Management", fifth edition, January 2018.

3.1.5 According to Table 10 of the SDM, the recommended design return period based on flood levels is 50 years ("Urban Drainage Branch Systems[1]") for conservative purpose. The rainfall intensities are calculated by Intensity-Duration-Frequency (IDF) Relationship (Section 4.3.3 of SDM Corrigendum 1/2024) with storm constants of HKO Headquarters's rainfall zone (Figure 4a & Table 3a of the SDM Corrigendum 1/2024).

3.1.6 As stated in Section 6.8 of the SDM Corrigendum 1/2022, drainage provision in new development areas should consider the climate change effects up to end of 21st century. Therefore, the increase of 16.0% in rainfall and 12.1% design allowance for end of 21st century (Tables 28 & 31 of SDM Corrigendum 1/2022) is incorporated into the calculation.

3.1.7 The capacities of the public stormwater pipes are calculated by Colebrook-White Equation. All existing public stormwater pipes in the assessment are assumed to be slimed concrete pipes under poor condition for conservative assessment.

[1] This Scheme do not intend altern or upgrade any trunk drains, which are equal to or larger than 1.8 m in diameter according to Section 6.6.2 of the SDM. Therefore, return period of "Urban Drainage Branch Systems" has been adopted.

3.2 Stormwater Discharge from the Scheme

3.2.1 The existing stormwater system and the stormwater catchments in the vicinity are illustrated in **Figures 3-1a to 3-1g**.

3.2.2 Under the existing condition, the stormwater from Sites A1 and B is discharged to the decked nullah within the sites via the local stormwater drainage system and/or short sections of public drainage pipes. As for Sites A2 to A5, the stormwater discharged from these sites is collected by local 300mm public drainage pipes that are connected to nearby 1200mm/1500mm public drainage pipes along the main street, which also connected to the decked nullah.

3.2.3 After the redevelopment, the stormwater from Sites A1 and B will be directly discharged to the decked nullah. For Sites A2 to A5, the stormwater will be discharged to the nearest public stormwater manholes, which will remain the same as in the existing condition.

3.2.4 Currently, there are some existing unpaved areas within Site B. Although the Scheme is not expected to reduce the total unpaved area of Site B, a fully paved scenario for all the Sites of the Scheme has been adopted for a conservative assessment.

3.2.5 The peak stormwater discharge from the Site, calculated as per **Section 3.1**, is summarised in **Table 3-2**. The detailed calculations are shown in **Appendix 3-1.**

Table 3-2 Peak Stormwater Discharge from the Site

Catchments	Description	Total Drainage Discharge (L/s)
S-A1	Site A1	290.0
S-A2	Site A2	25.5
S-A3	Site A3	11.8
S-A4	Site A4	22.0
S-A5	Site A5	23.7
S-B	Site B	1901.7

Note:
[1] Detailed calculations are shown in **Appendix 3-1**.
[2] Assume a fully paved scenario

3.3 Stormwater Discharge from Surrounding Catchments

3.3.1 The surrounding developments and roads near the Scheme are divided into different catchments (B1 to B4 for developments; R1 to R6 for road surfaces) based on the existing public stormwater drainage system. The stormwater catchment areas in the vicinity of the Site are illustrated in **Figures 3-1a to 3-1g**. The stormwater discharge from surrounding developments and roads are summarised in **Table 3-3 & Table 3-4**. The detailed calculations are shown in **Appendix 3-1**.

Table 3-3 Stormwater Discharge from Surrounding Buildings

Catchments	Description	Total Drainage Discharge (L/s)
B1	Existing Development	1766.5
B2	Existing Development	390.7
B3	Existing Development	124.9
B4	Existing Development	68.9

Note:
[1] Detailed calculations are shown in **Appendix 3-1**.

Table 3-4 Stormwater Discharge from Surrounding Roads

Catchments	Description	Total Drainage Discharge (L/s)
R1	Paved Road	312.3
R2	Paved Road	108.0
R3	Paved Road	106.8
R4	Paved Road	61.9
R5	Paved Road	182.6
R6	Paved Road	185.1

Note:
[1] Detailed calculations are shown in **Appendix 3-1**.

3.4 Assessment of Existing Stormwater System, Proposed New Stormwater Pipes and Proposed Upgrades

Planned Demolition, Diversion, and Upgrades

3.4.1 The stormwater pipes affected by the Proposed Development need to be evaluated to determine if they can accommodate the stormwater discharge. Additionally, certain existing stormwater pipes are planned for demolition or reconstruction due to scheme requirements or practical considerations. The existing stormwater pipes to be demolished and upgraded are illustrated in **Figure 3-2**, while the proposed new pipes and upgrades are shown in **Figures 3-3a to 3-3f**. Unless specified, the proposed upgrades and new pipes will be either PE pipes or precast concrete pipes with PVC or equivalent lining.

Near Sites A1 & B

3.4.2 Firstly, to facilitate the potential underground pedestrian connection between Site A1 and Site B, as shown in **Figure 3-2**, the existing 975mm stormwater pipes along Sai Yee Street, between the public existing stormwater manholes SMH4020120 to SMH4020145, are tentatively planned for removal. The elevation and extent of the pedestrian connection are subject to detailed design.

3.4.3 In order to redirect the upstream stormwater flow at existing stormwater manhole SMH4020120, proposed new stormwater pipes along Playing Field Road have been planned. These pipes will direct the upstream flow from Sai Yee Street towards another existing stormwater manhole SMH4020576 located at the junction of Fa Yuen Street, as illustrated in **Figure 3-3b**.

3.4.4 Secondly, to facilitate the construction of the basement at Site A1, all existing public stormwater pipes within Site A1 will be demolished, as depicted in **Figure 3-2**. Consequently,

the current stormwater discharge route from the developments north of Site A1 (Catchment B3) will no longer be available once the excavation works at Site A1 commence. To address this, the stormwater from Catchment B3 will be redirected to the existing stormwater pipes along Fa Yuen Street, as shown in **Figure 3-3b**. As a result, the flow direction of the existing public stormwater pipes PS01 & PS02 will be reversed.

3.4.5 It is important to note that the existing downstream stormwater pipes along Fa Yuen Street are not designed to handle the diverted stormwater flow as per the planned configuration shown in **Figure 3-3b**. Therefore, it will be necessary to upgrade the downstream stormwater pipes (PS03 to PS09; **Figures 3-3b & 3-3c**) to ensure they can effectively handle the increased flow.

Near Sites A2 - A5

3.4.6 As indicated in **Sections 2.2.11**, the stormwater discharge from Sites A2-A5 is relatively small in comparison to the capacity of the larger-scale stormwater pipes in their downstream vicinity (1275mm & 1500mm), as depicted in **Figures 3-3e** and **3-3f**. Consequently, it is anticipated that there will be no adverse drainage impact arising from Sites A2, A3, A4, and A5. Therefore, a detailed assessment of their downstream stormwater pipes is not deemed necessary at this stage.

Capacity of Existing Downstream Stormwater Pipes

3.4.7 The capacities of the affected downstream stormwater pipe sections (PS01 - PS09), based on the planned flow configuration as illustrated in **Figures 3-3b & 3-3c**, have been calculated using Colebrook-White Equation. The calculated capacities are listed in **Table 3-5** and the detailed calculation can be found in **Table A of Appendix 3-2**.

Table 3-5 Capacity of Existing Stormwater Pipes

Pipe Section	Upstream Manhole	Downstream Manhole	Full Capacity (L/s)
PS01 [1]	SMH4020140	SMH4093500	-
PS02 [1]	SMH4093500	SMH4020139	-
PS03	SMH4020576	SMH4059700	531.1
PS04	SMH4059700	SMH4020571	858.4
PS05	SMH4020571	SMH4020572	393.8
PS06	SMH4020572	SMH4020585	802.5
PS07	SMH4020585	SMH4059701	612.8
PS08 [2]	SMH4059701	SMH4059702	727.0
PS09 [2]	SMH4059702	to Nullah	473.8

Note:
[1] The flow direction of PS01 to PS02 shall be reversed thus the existing pipes need to be reconstructed.
[2] PS08 & PS09 consist of 2 pipes
[3] The calculation is detailed in **Appendix 3-2**.

3.4.8 A summary of the utilization of the existing downstream stormwater pipe are shown in **Table 3-6**. Detailed calculation can be found in **Table A of Appendix 3-2**. The results indicate that the existing stormwater pipes PS03 to PS09 are unable to cater the expected stormwater flow, while the flow direction of PS01 to PS02 shall be reversed.

Table 3-6 Proportion of Peak Flow to Full Capacity (Existing Pipes)

Pipe Section	Full Capacity (L/s)	Peak Flow (L/s)	Utilization (%)
PS01 [1]	-	124.9	-
PS02 [1]	-	124.9	-
PS03	531.1	3307.6	**623%**
PS04	858.4	3307.6	**385%**
PS05	393.8	3307.6	**840%**
PS06	802.5	3307.6	**412%**
PS07	612.8	3307.6	**540%**
PS08 [2]	727.0	3307.6	**455%**
PS09 [2]	473.8	3307.6	**698%**

Note:
[1] The flow direction of PS01 to PS02 shall be reversed thus the existing pipes need to be reconstructed.
[2] PS08 & PS09 consist of 2 pipes
[3] The calculation is detailed in **Appendix 3-2**.

Terminal Manholes and Discharge Pipes of the Sites

3.4.9 The stormwater discharge from the Site A1 is proposed to be collected by terminal manhole STMH-A01 and discharged via the proposed pipe PP-A01, which has a diameter of 500mm and slope of 1:50. The pipe will be connected to the decked nullah as shown in **Figure 3-3c**.

3.4.10 The stormwater discharge from the Site A2 is proposed to be collected by terminal manhole STMH-A02 and discharged via the proposed pipe PP-A02, which has a diameter of 225mm and slope of 1:50. The pipe will be connected to the existing public stormwater manhole SMH4020522 as shown in **Figure 3-3e**.

3.4.11 The stormwater discharge from the Site A3 is proposed to be collected by terminal manhole STMH-A03 and discharged via the proposed pipe PP-A03, which has a diameter of 225mm and slope of 1:50. The pipe will be connected to the existing public stormwater manhole SMH4020520 as shown in **Figure 3-3e**.

3.4.12 The stormwater discharge from the Site A4 is proposed to be collected by terminal manhole STMH-A04 and discharged via the proposed pipe PP-A04, which has a diameter of 225mm and slope of 1:50. The pipe will be connected to the existing public stormwater manhole SMH4098783 as shown in **Figure 3-3f**.

3.4.13 The stormwater discharge from the Site A5 is proposed to be collected by terminal manhole STMH-A05 and discharged via the proposed pipe PP-A05, which has a diameter of 225mm and slope of 1:50. The pipe will be connected to the existing public stormwater manhole SMH4020531 as shown in **Figure 3-3f**.

3.4.14 The stormwater discharge from the Site B is proposed to be collected by terminal manhole STMH-B01 and discharged via the proposed pipe PP-B01, which has a diameter of 900mm and slope of 1:50. The pipe will be connected to the decked nullah as shown in **Figure 3-3d**.

Proposed New Pipes and Upgrades in the Surrounding

3.4.15 Apart from the stormwater pipes connected to the terminal manholes of the Sites, there are three proposed new stormwater pipes (PP-D01 to PP-D03) for the purpose of stormwater diversion, as depicted in **Figure 3-3b**. PP-D01 and PP-D02 are 1700mm pipes designed to redirect stormwater from Sai Yee Street to Fa Yuen Street. PP-D03 is a 400mm pipe intended to divert stormwater from the existing developments to the north of Site A1 (Catchment B3).

3.4.16 There are nine pipes (PS01 to PS09) proposed for upgrading and/or modification, as shown in **Figures 3-3b and 3-3c**. The slope of PS01 and PS02 is planned to be reversed to change the flow direction. PS03 to PS07 are scheduled for upgrading from 900mm pipes to 1700mm pipes with revised invert levels to accommodate the increased stormwater flow.

3.4.17 It is important to note that PS08 and PS09 (refer to **Figure 3-3c**) are currently located beneath the existing sewers FWD4099180 and FWD4018380, respectively. Based on the separately conducted Sewerage Impact Assessment (SIA) for this S.16 application. FWD4099180 is proposed to be demolished during redevelopment. FWD4018380 will be divided into two sections of sewers, and PS09 will intersect the middle of a proposed sewer. The new sewer to be constructed above PS09 will be a 900mm sewer with an invert level of 3.79 - 3.75 mPD. Considering the typical thickness of a 900mm sewer (0.11m), the bottom of the sewer at the crossing location will be approximately ((3.79+3.75)/2 - 0.11) = 3.66 mPD. To maintain a 300mm vertical clearance between the proposed drainage pipe and the proposed sewer, the top of the drain pipe should not exceed 3.36 mPD at the crossing location.

3.4.18 The lowest allowable invert level at the connection point of PS09 to the nullah is estimated based on available information. According to the drainage record plans, the invert level of the nullah 110m upstream of the connection point is 2.74 mPD (SGJ4012541), and the invert level of the nullah 23m downstream of the connection point is 2.43 mPD (SGJ4002734). By interpolation, the lowest feasible invert level for the connection point is determined to be 2.484 mPD. Therefore, an invert level of 2.485mPD has been proposed in the assessment. The details of the connection to the nullah will be subject to detail design after the planning stage.

3.4.19 Due to the aforementioned restriction, it will be necessary to utilize multiple 750mm pipes for PS09. On the other hand, since there is no height limitation for PS08, it is preferable to use a single large-diameter pipe. Therefore, the proposal includes upgrading PS08 from twin 700mm pipes to a single 1700mm pipe and upgrading PS09 from twin 700mm pipes to four 750mm pipes to accommodate the increased stormwater flow.

3.4.20 The details of connections to box culverts for Proposed Pipes PS09, PP-A01 & PP-B01 are subject to detailed design after the planning stage.

3.4.21 The proposed new pipes and upgrades are presented in **Table 3-7 & Table 3-8** below. The exact location of the new manholes and invert levels will be subject to detailed design. With the proposed new pipes and upgrades, the downstream pipes will be able to cater the expected peak stormwater flow, thus no adverse drainage impact arising from the Proposed Development is anticipated.

Table 3-7 Proportion of Peak Flow to Full Capacity (Proposed New Pipes)

Pipe Section	Upstream Manhole	Downstream Manhole	Diameter (m)	Full Capacity (L/s)	Peak Flow (L/s)	Utilization (%)
PP-A01	STMH-A01	to Nullah	0.500	588.1	290.0	49%
PP-A02	STMH-A02	SMH4020522	0.225	72.2	25.5	35%
PP-A03	STMH-A03	SMH4020520	0.225	72.2	11.8	16%
PP-A04	STMH-A04	SMH4098783	0.225	72.2	22.0	30%
PP-A05	STMH-A05	SMH4020531	0.225	72.2	23.7	33%
PP-B01	STMH-B01	to Nullah	0.900	2735.8	1901.7	70%
PP-D01	SMH4020120	SMH-D01	1.700	3998.0	2684.3	67%
PP-D02 [2]	SMH-D01	SMH4020576	1.700	4192.4	2871.1	68%
PP-D03	SMH4020139	SMH-D01	0.400	275.2	124.9	45%

Note:
[1] The calculation is detailed in **Appendix 3-2**.
[2] New pipe PP-D02 is not required under Alternative Scenario as illustrated in **Section 3.5**.
[3] Unless specified, the proposed pipes will be either PE pipes or precast concrete pipes with PVC or equivalent lining.

Table 3-8 Proportion of Peak Flow to Full Capacity (Proposed Upgrades)

Pipe Section	Upstream Manhole	Downstream Manhole	Diameter (m)	Full Capacity (L/s)	Peak Flow (L/s)	Utilization (%)
PS01	SMH4020140	SMH4093500	0.300	269.8	124.9	46%
PS02	SMH4093500	SMH4020139	0.300	212.2	124.9	59%
PS03 [3]	SMH4020576	SMH4059700	1.700	4522.0	3307.6	73%
PS04 [3]	SMH4059700	SMH4020571	1.700	4522.0	3307.6	73%
PS05 [3]	SMH4020571	SMH4020572	1.700	4522.0	3307.6	73%
PS06 [3]	SMH4020572	SMH4020585	1.700	4522.0	3307.6	73%
PS07 [3]	SMH4020585	SMH4059701	1.700	4522.0	3307.6	73%
PS08 [3]	SMH4059701	SMH4059702	1.700	4522.0	3307.6	73%
PS09 [1]	SMH4059702	to Nullah	0.750	4605.4	3307.6	72%

Note:
[1] PS09 consist of 4 pipes
[2] The calculation is detailed in **Appendix 3-2**.
[3] Upgrade is not required for PS03 – PS08 under Alternative Scenario as illustrated in **Section 3.5**.
[4] Unless specified, the proposed upgrades pipes will be either PE pipes or precast concrete pipes with PVC or equivalent lining.

3.5 Potential Alternative Scenario

3.5.1 As stated in **Section 3.4.2**, the existing 975mm stormwater pipes along Sai Yee Street between the public existing stormwater manholes SMH4020120 to SMH4020145 along Sai Yee Street (**Figure 3-2**) are planned for removal due to the potential underground pedestrian connection between Site A1 and Site B.

3.5.2 As the alignment and design of the potential underground pedestrian connection is subject to detailed design, if the affected area of the underground pedestrian connection is limited to a certain elevation, e.g.: 1mPD or lower, it is possible that the existing 975mm stormwater pipes along Sai Yee Street (between SMH4020120 to SMH4020145) can be kept and the

diversion of the stormwater pipe along Playing Field Road (between SMH4020120 & SMH4020576) is no longer required.

3.5.3 In this case, the stormwater of the Catchment B3 can be diverted to SMH4020120 as illustrated in **Figure 3-4**. The proposed new pipe PP-D02 and the upgrade of PS03 - PS08 (in **Figures 3-3b & 3-3c**) are no longer required as those pipes are not affected by the Scheme. However, the modification of PS09 shall still be required to leave a sufficient room for the potential sewer above PS09 as stated in **Section 3.4.17**. The potential diversion route of the potential alternative scenario is illustrated in **Figure 3-4**.

4 CONCLUSION

4.1.1 This Drainage Impact Assessment has been undertaken to assess the potential drainage impact of the Proposed Development and to serves as a supporting document for the S.16 Application to the TPB for consideration.

4.1.2 The stormwater discharge from Site A1 is proposed to be connected to the decked nullah through the proposed pipe PP-A01, which has a diameter of 500mm and a slope of 1:50.

4.1.3 The stormwater discharge from Sites A2, A3, A4, and A5 is proposed to be connected to nearby public stormwater manholes through the proposed pipes PP-A02, PP-A03, PP-A04, and PP-A05, respectively. These pipes have a diameter of 225mm and a slope of 1:50.

4.1.4 The stormwater discharge from Site B is proposed to be connected to the decked nullah through the proposed pipes PP-B01, which has a diameter of 900mm and a slope of 1:50.

4.1.5 There are three proposed new stormwater pipes (PP-D01 to PP-D03) for the purpose of stormwater diversion. PP-D01 and PP-D02 are 1700mm pipes designed to divert stormwater from Sai Yee Street to Fa Yuen Street. PP-D03 is a 400mm pipe intended to divert stormwater from the existing developments to the north of Site A1.

4.1.6 There are nine pipes (PS01 to PS09) proposed to be upgraded and/or modified. The slope of PS01 and PS02 is proposed to be reversed to change the flow direction. PS03 to PS07 are planned for upgrading from 900mm pipes to 1700mm pipes with revised invert levels to accommodate the increased stormwater flow. PS08 is proposed to upgrade from twin 700mm pipes to a single 1700mm pipe; while PS09 is proposed to upgrade from twin 700mm pipes to four 750mm pipes with revised invert levels to cater for the increased stormwater flow.

4.1.7 With the proposed new pipes and upgrades, the downstream pipes will be able to cater for the expected peak stormwater flow, thus no adverse drainage impact arising from the Proposed Development with the minor relaxation of domestic GFA in Site B under the S.16 Application is anticipated.

4.1.8 It should be noted that the designs of the potential underground pedestrian connection is subject to detailed design. If the affected area of the underground pedestrian connection is limited to a certain elevation, it is possible that the existing 975mm stormwater pipes along Sai Yee Street can be kept and the diversion of the stormwater pipe at manhole SMH4020120 is no longer required. In this case, the stormwater of the Catchment B3 can be diverted to SMH4020120 with a much smaller pipe. The proposed new pipe PP-D-02 and the upgrade of PS03 - PS08 (**Figures 3-3b & 3-3c**) are also no longer required as they are not affected by the Scheme. However, the modification of PS09 shall still be required to leave a sufficient room for the potential sewer above PS09. Under this alternative scenario, there is also no adverse impact arising from the Proposed Development anticipated.

4.1.9 During the detailed design stage, a comprehensive site survey will be conducted to ascertain the site conditions and layout. An appropriate drainage proposal will be developed, subject to further liaison with the relevant government departments.

FIGURES

Scheme Boundary

Application Site

Sub-area (1)

Sub-area (2)

Site B

Site A1

Site A2

Site A3

Site A4

Site A5

Sai Yee Street

Fa Yuen Street

Prince Edward Road West

FLOWER MARKET ROAD

FA YUEN STREET

YUEN NGAI STREET

YUEN PO STREET

界限街

花園街

洗衣街

花墟道

旺角大球場

Mong Kok Stadium

High Park Grand

Fullend Court

Jenny's Court

Podium

Oscar Court

Flower Villa

King's Court

Ever Court

Mandarin Court

Springfield Court

Kingly House

Fa Yuen Mansion

Prince Commercial Building

Wai Hing Building

Cheung Lo Church (Church of Christ in China)

Masts

Stand

ESS

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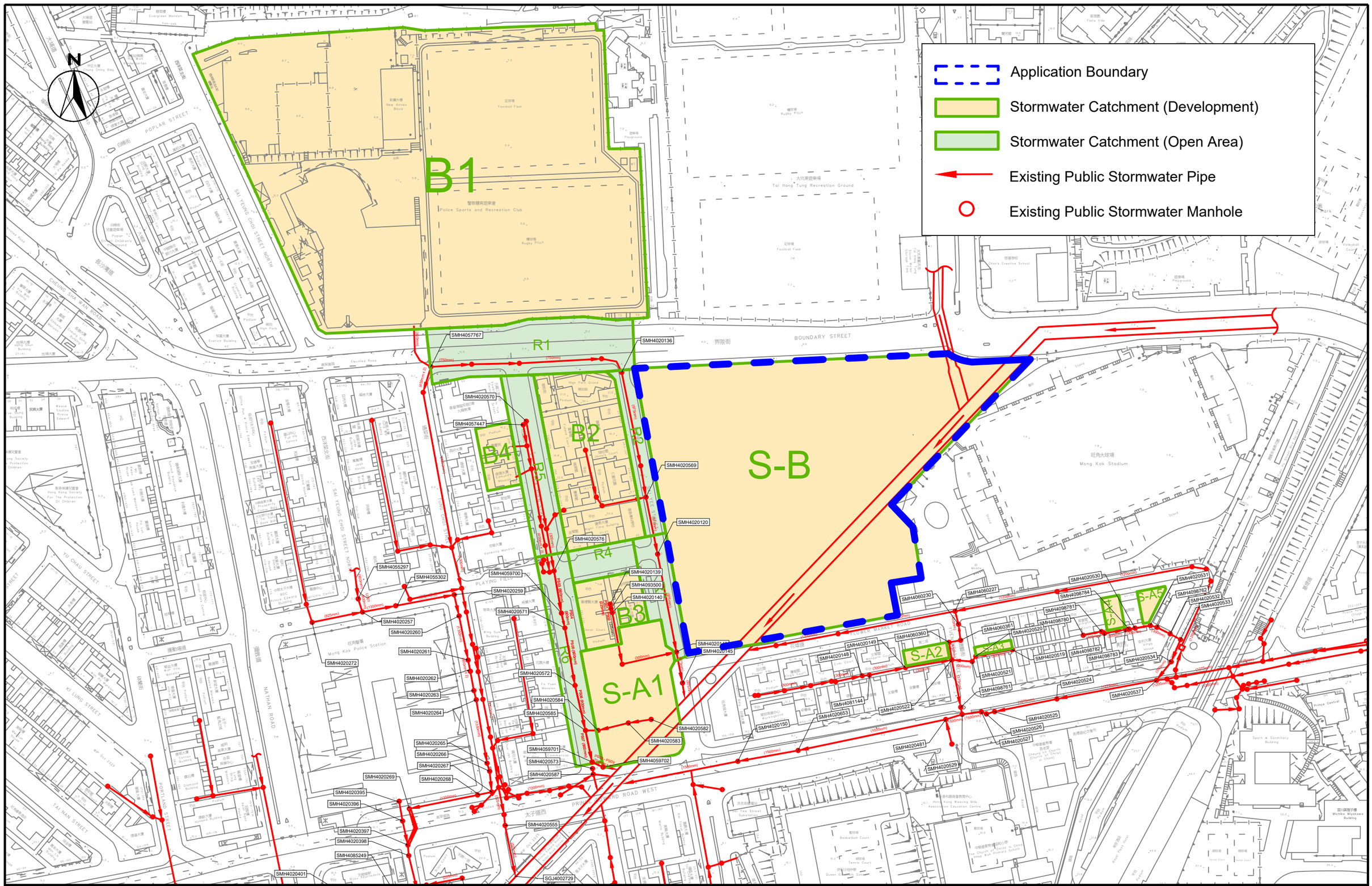
Site Location Plan

SCALE	1:1000 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 1-1
		REV	-



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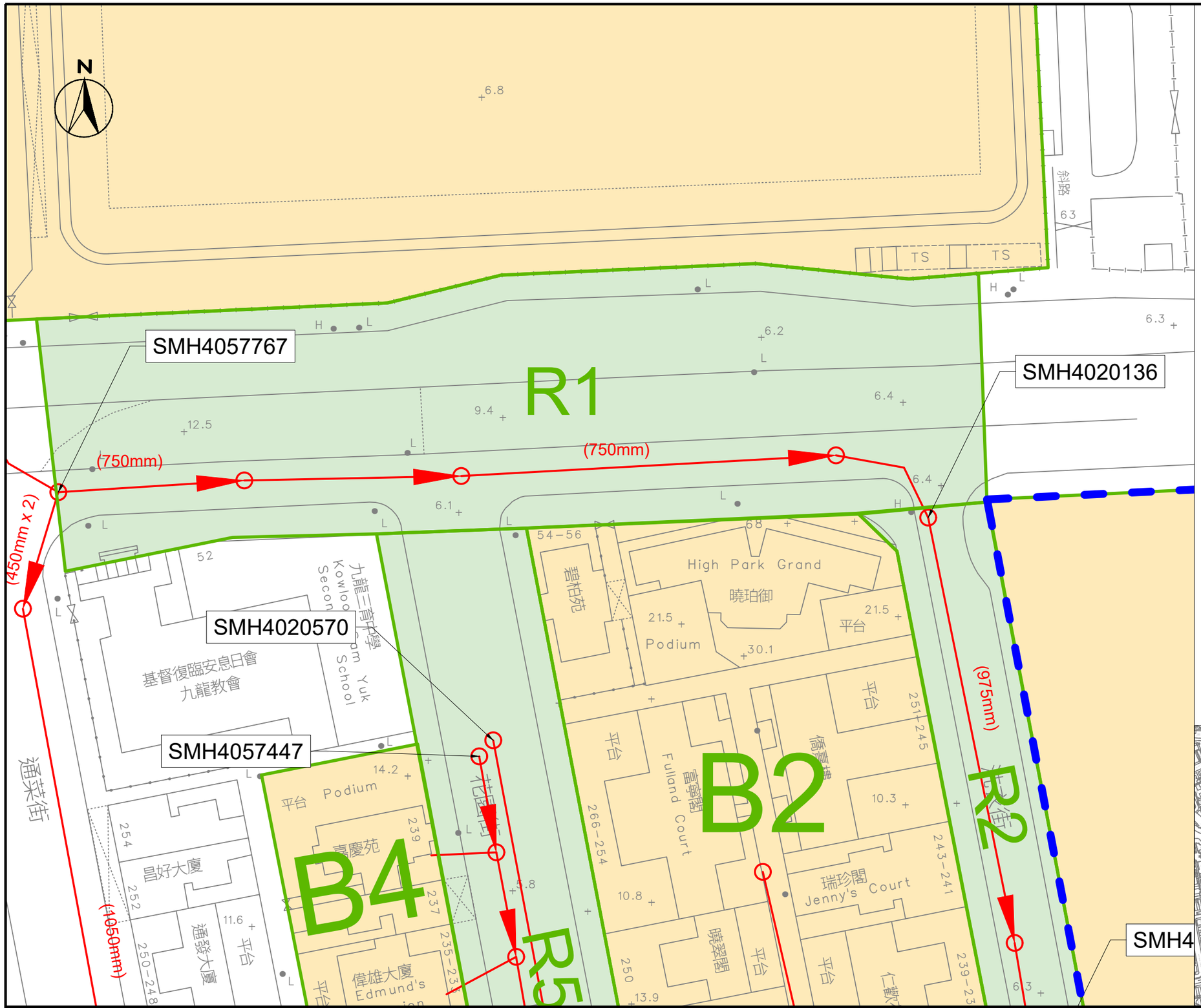
Existing Stormwater System in the Vicinity (Overview)

SCALE	1:2000 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1a
		REV	-



Application Boundary

Stormwater Catchment (Development)

Stormwater Catchment (Open Area)

Existing Public Stormwater Pipe

Existing Public Stormwater Manhole

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Sai Yee Street/ Flower Market Road Development Scheme

Existing Stormwater System in the Vicinity - 1

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1b
		REV	-

Application Boundary

Stormwater Catchment (Development)

Stormwater Catchment (Open Area)

Existing Public Stormwater Pipe

Existing Public Stormwater Manhole

SMH4020576

SMH4059700

SMH4055302

SMH4020259

SMH4020571

SMH4020572

SMH4020139

SMH4093500

SMH4020140

(1000mm)

(400mm x 2)

(300mm)

(975mm)

PS03 (900mm)

PS04 (900mm)

PS05 (900mm)

PS01 - PS02 (225mm)

(225mm)

(1350mm)

(900mm x 2)

(300mm)

(975mm)

R4

R6

B3

S-A1

TUNG CHOI STREET

FA YUEN STREET

SAI YEE STREET

PLAYING FIELD ROAD

運動場道

Key Plan
1:8000 @ A3

3-1b
3-1c
3-1d
3-1e
3-1f
3-1g

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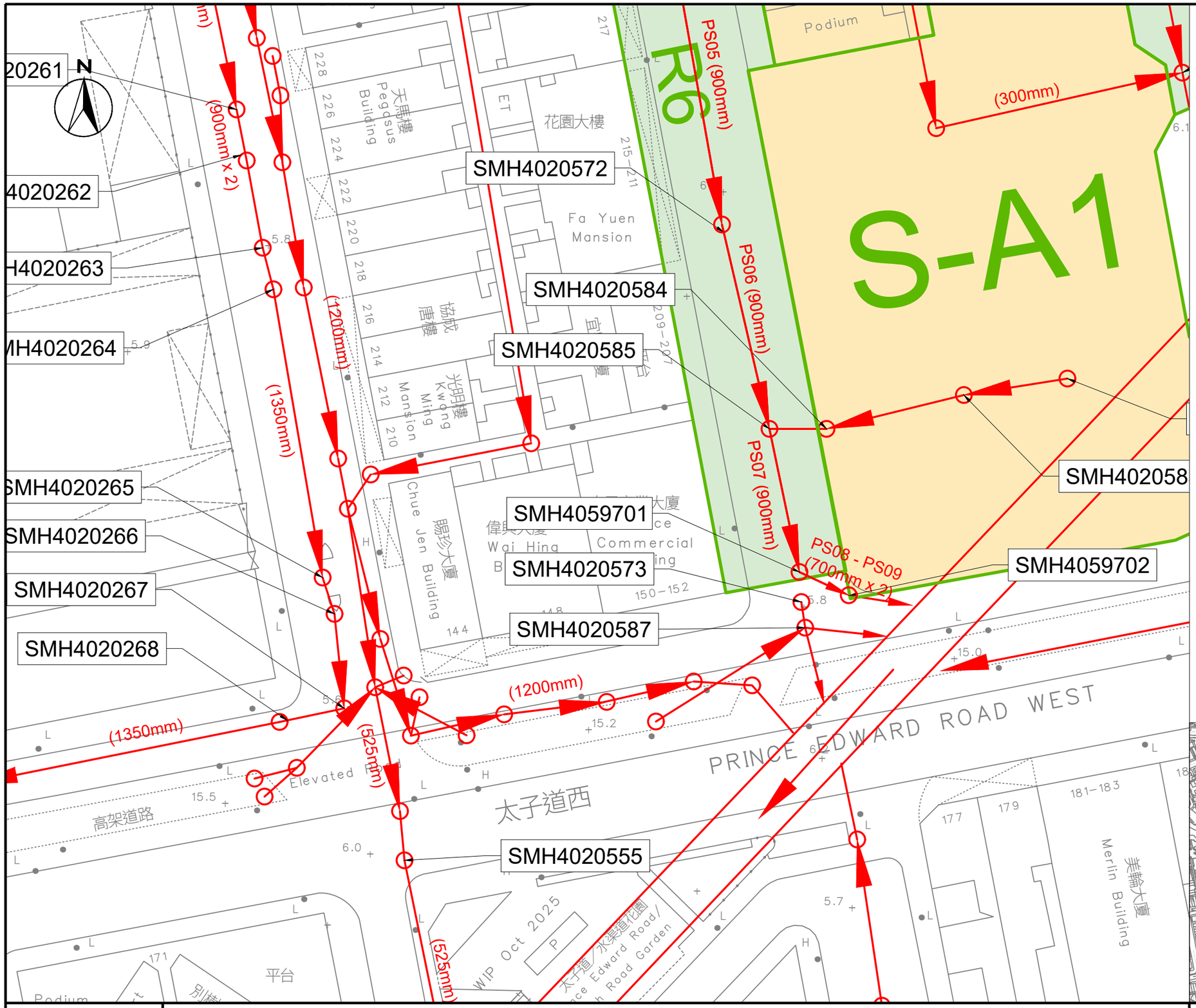
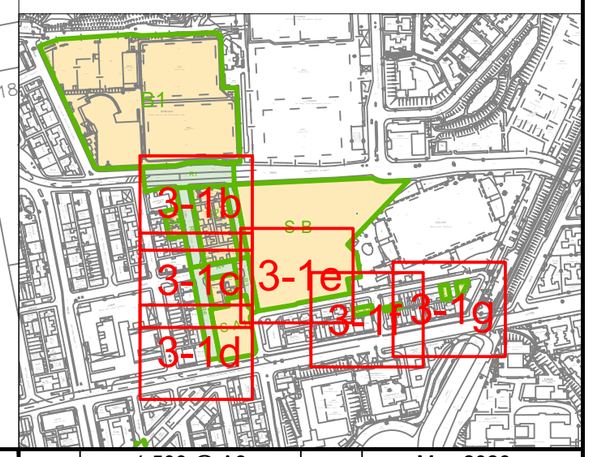
Sai Yee Street/ Flower Market Road Development Scheme

Existing Stormwater System in the Vicinity - 2

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1c
		REV	-



Key Plan
1:8000 @ A3



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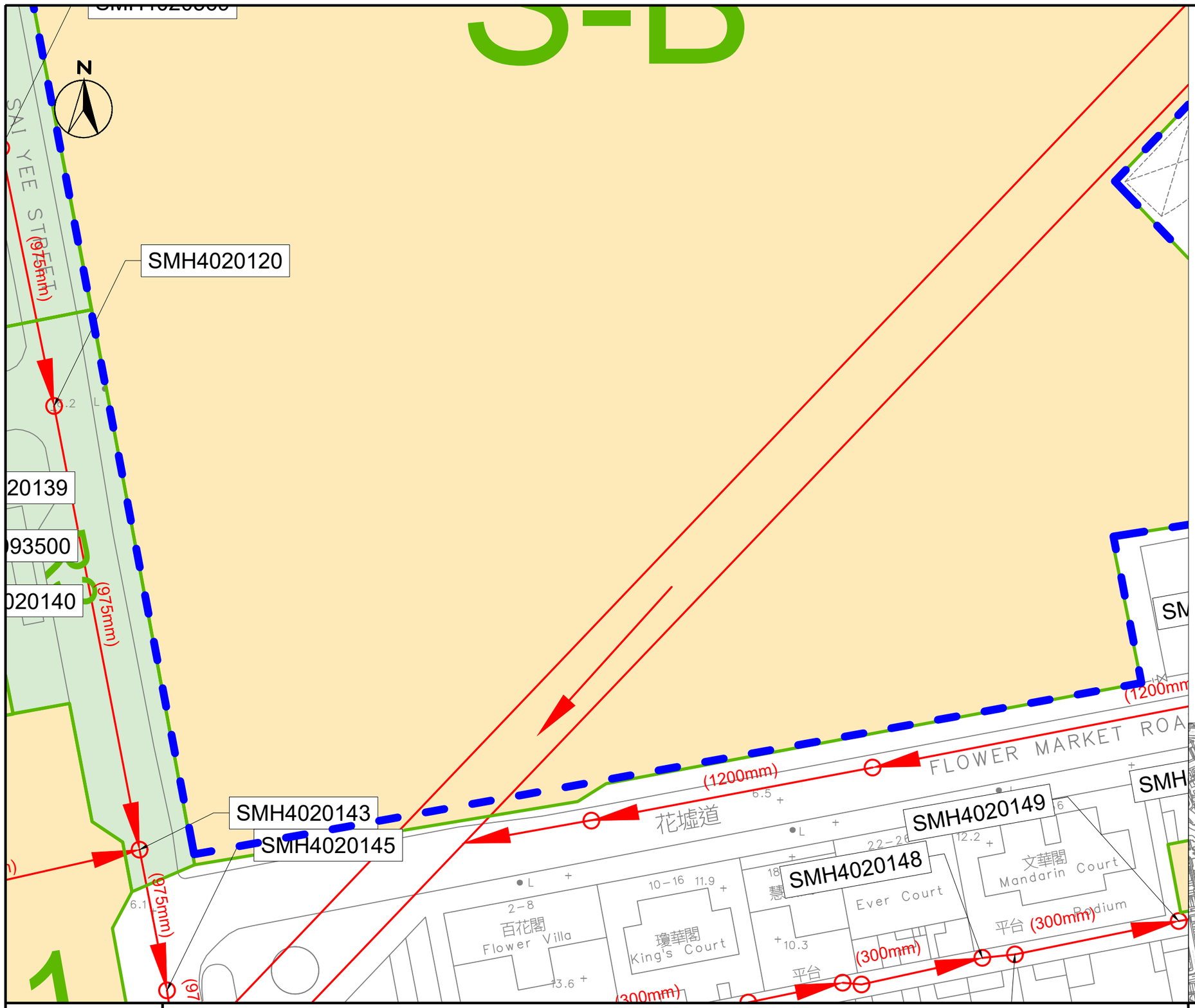
Existing Stormwater System in the Vicinity - 3

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1d
		REV	-



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Existing Stormwater System in the Vicinity - 4

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1e
		REV	-

N

SMH4060230

SMH4060227

SMH4020149

SMH4060360

SMH4020148

SMH4060361

SMH4020520

SMH4020519

SMH4020521

SMH4098761

SMH4081144

SMH4020653

SMH4020522

SMH4020525

SMH4020526

SMH4020527

SMH4020481

SMH4020529

S-A2

S-A3

FLOWER MARKET ROAD

YUEN MAN TSEE STREET

園藝街

(1200mm)

(450mm)

(300mm)

(375mm)

(1275mm)

(1500mm)

Application Boundary

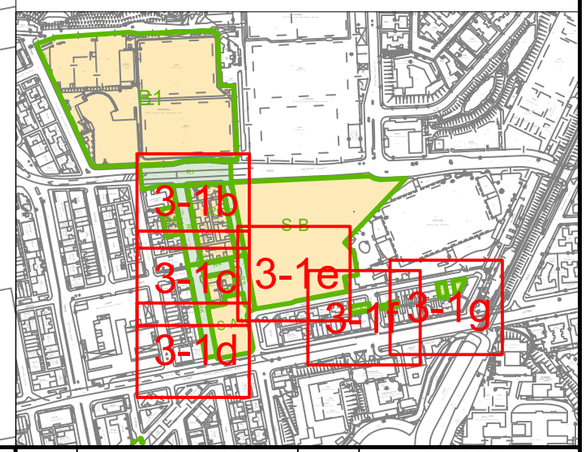
Stormwater Catchment (Development)

Stormwater Catchment (Open Area)

Existing Public Stormwater Pipe

Existing Public Stormwater Manhole

Key Plan
1:8000 @ A3



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Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority
Sai Yee Street/ Flower Market Road Development Scheme

Existing Stormwater System in the Vicinity - 5

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1f
		REV	-

N

SMH4020530
SMH4098784
SMH4098781
SMH4098780
SMH4020520
SMH4020519
SMH4098782
SMH4098783
SMH4020534
SMH4020531
SMH4098762
SMH4020532
SMH4020533
SMH4020524
SMH4020537
SMH4020525
SMH4020526
SMH4020527
SMH4060361
SMH4020521
SMH4098761

(1200mm)
(1275mm)
(300mm)
(1125mm)

S-A3
S-A4
S-A5

看台
Podium
翠景閣 Springfield Court
嘉興閣
寶來閣 Po Loy Court
金利大廈 Kingly House
平台 Podium
馬禮遜紀念會所
中華基督教會 長老堂 Cheung Lo Church (Church of Christ in China)
KUEN PO STREET
MTR (East Rail Line)

Application Boundary

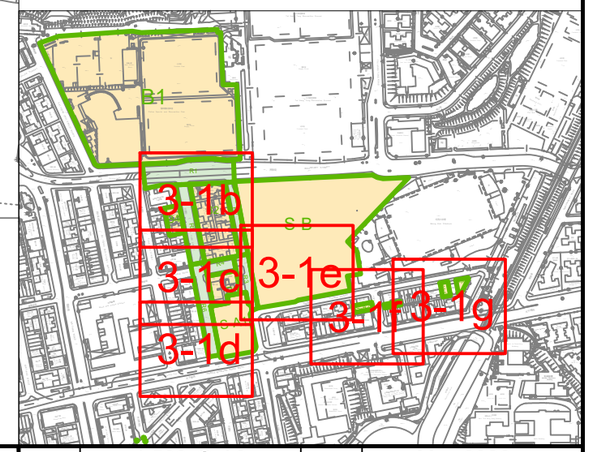
Stormwater Catchment (Development)

Stormwater Catchment (Open Area)

Existing Public Stormwater Pipe

Existing Public Stormwater Manhole

Key Plan
1:8000 @ A3



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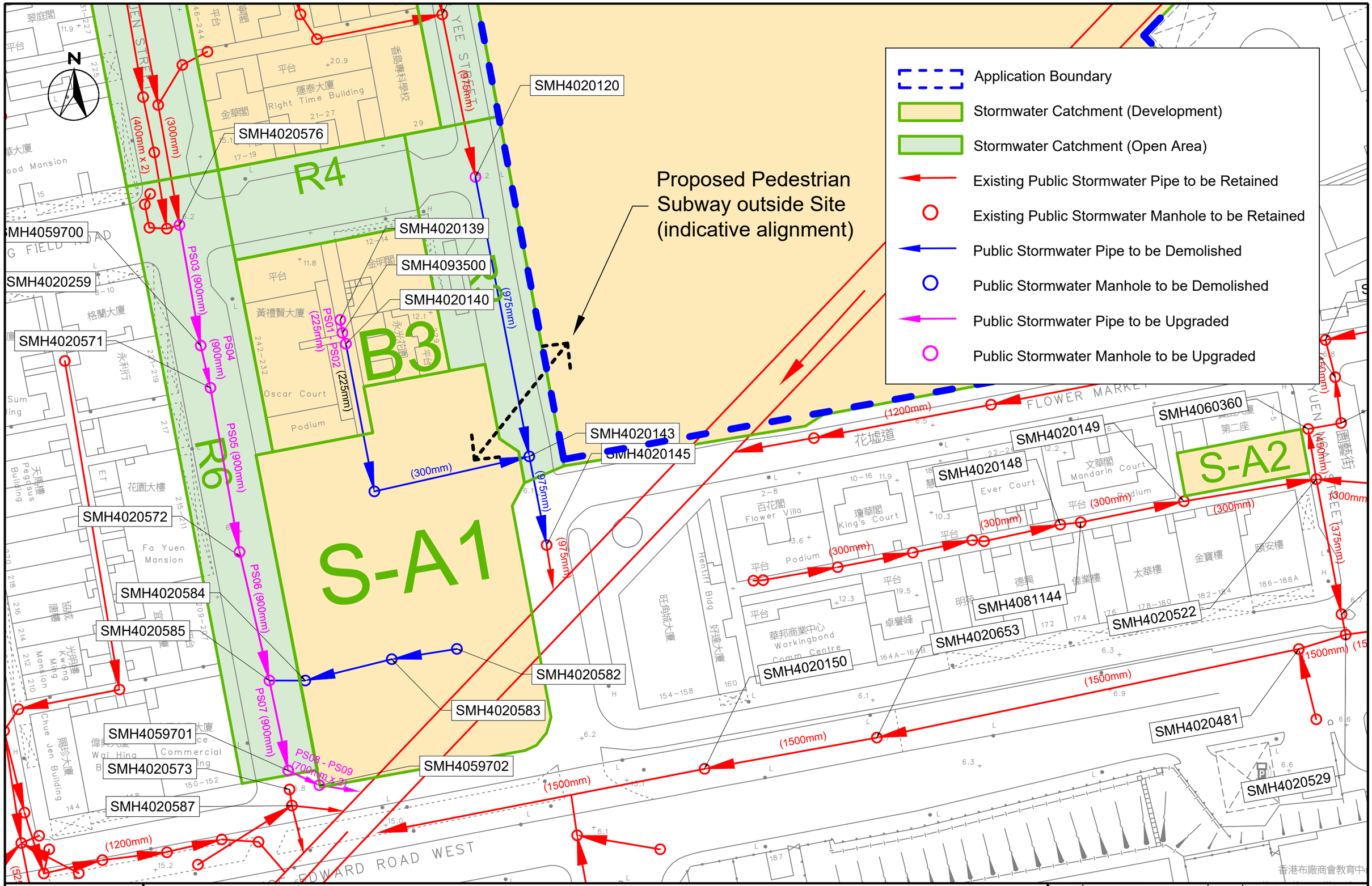
Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority
Sai Yee Street/ Flower Market Road Development Scheme

Existing Stormwater System in the Vicinity - 6

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-1g
		REV	-



Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority
Sai Yee Street/ Flower Market Road Development Scheme

Existing Stormwater Pipes and Manholes to be Demolished

SCALE	1:700 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-2
		REV	-

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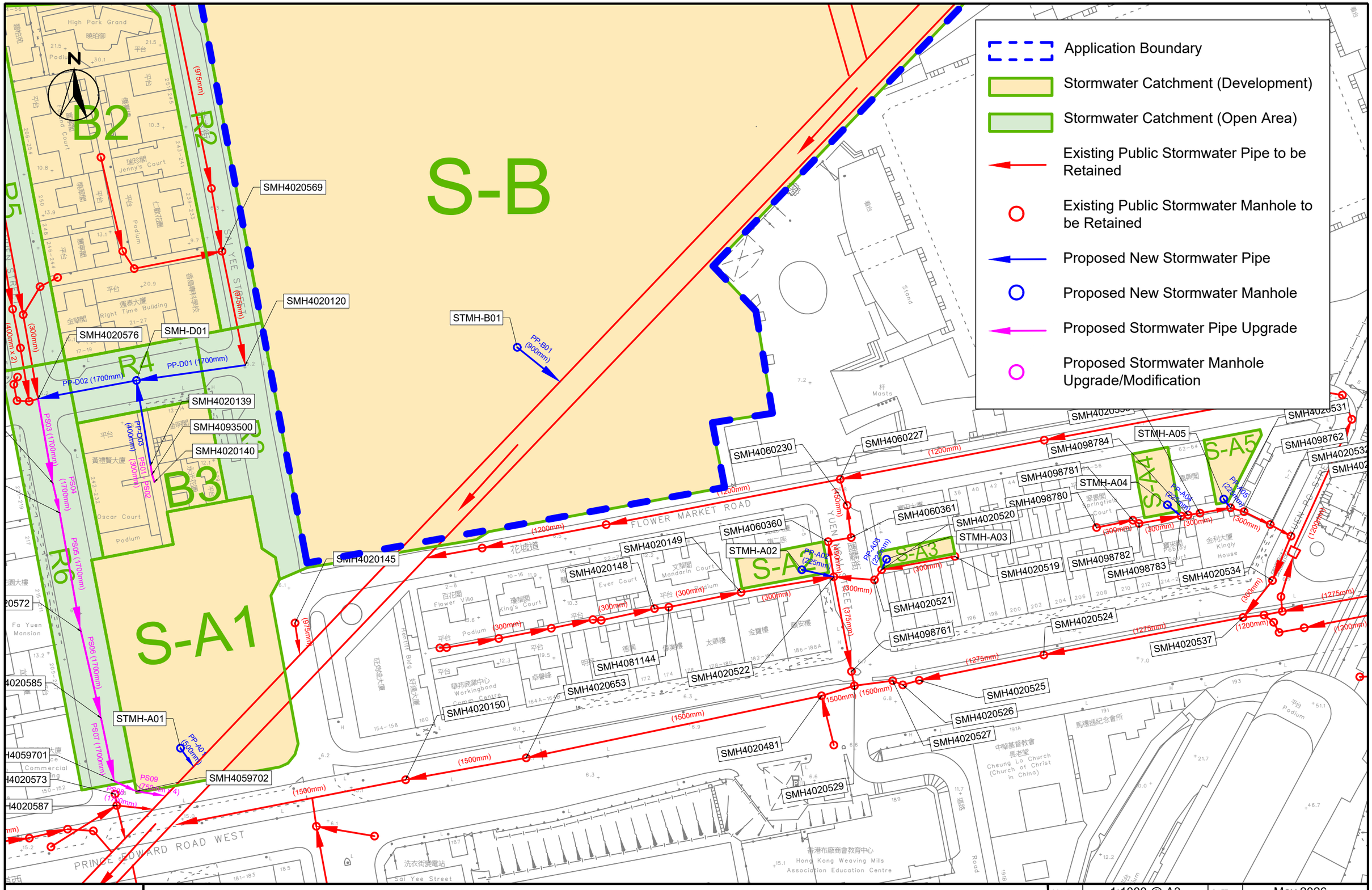

Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority
Sai Yee Street/ Flower Market Road Development Scheme

Proposed Stormwater Pipe and Manholes (Overview)

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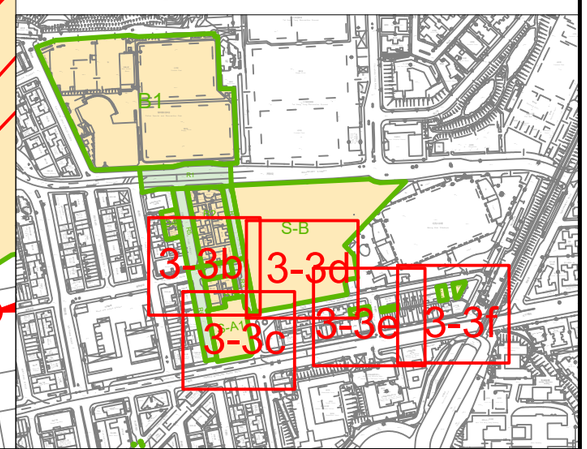
SCALE	1:1000 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-3a
		REV	-

SMH4020569
SMH4020120
SMH4020576
SMH-D01
SMH4020139
SMH4093500
SMH4020140
SMH4020145
STMH-B
PP-D01 (1700mm)
PP-D02 (1700mm)
PP-D03 (400mm)
PS01 - PS02 (300mm)
PS03 (1700mm)
PS04 (1700mm)
PS05 (1700mm
(400mm x 2)
(300mm)
(975mm)
R5
R4
B3
R6
SAI YEE STREET
FA YUEN STREET
瑞珍閣 Jenny's Court
曉翠閣
仁歡花園
Podium
運泰大廈 Right Time Building
香島專科學校
金華閣
金明閣
黃禮賢大廈
Oscar Court
永光花園
永利行
格蘭大廈
花園大樓

Application Boundary
Stormwater Catchment (Development)
Stormwater Catchment (Open Area)
Existing Public Stormwater Pipe to be Retained
Existing Public Stormwater Manhole to be Retained
Proposed New Stormwater Pipe
Proposed New Stormwater Manhole
Proposed Stormwater Pipe Upgrade
Proposed Stormwater Manhole Upgrade/Modification

Key Plan
1:8000 @ A3



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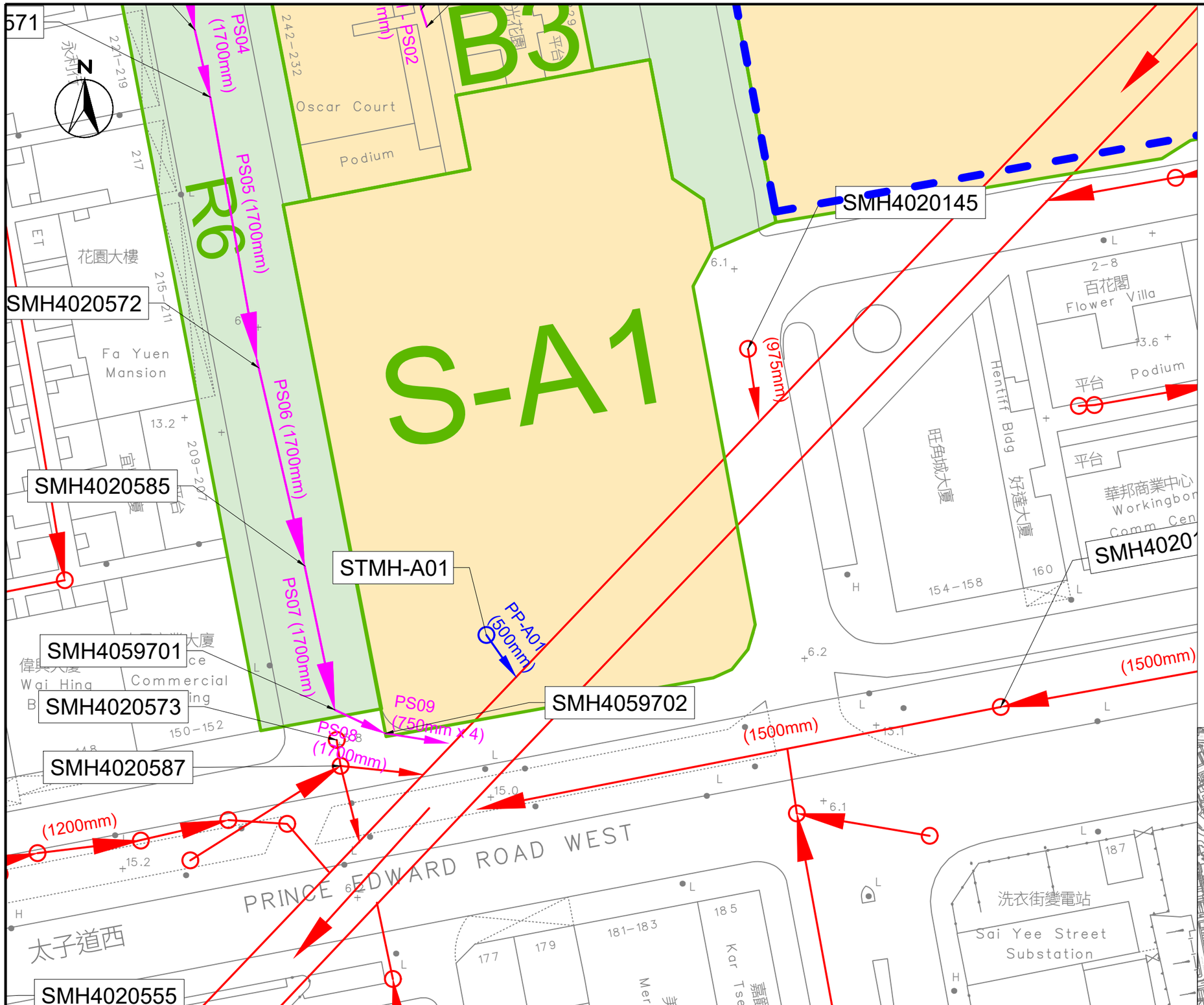
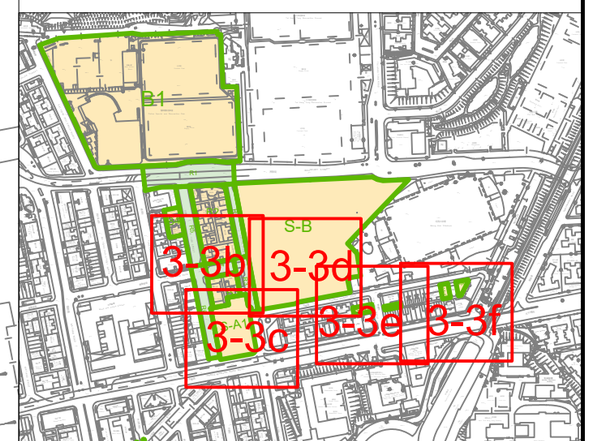
Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority Sai Yee Street/ Flower Market Road Development Scheme

Proposed Stormwater Pipe and Manholes - 1

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-3b
		REV	-



Key Plan
1:8000 @ A3



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Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority Sai Yee Street/ Flower Market Road Development Scheme

Proposed Stormwater Pipe and Manholes - 2

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-3c
		REV	-

S-B

SMH4020569

SMH4020120

STMH-B01

PP-B01
(900mm)

SMH4020145

SMH4020148

SMH4020149

SMH4060360

STMH-A02

(1200mm)

(1200mm)

(300mm)

FLOWER MARKET ROAD

花墟道

Ever Court

文華閣
Mandarin Court

Application Boundary

Stormwater Catchment (Development)

Stormwater Catchment (Open Area)

Existing Public Stormwater Pipe to be Retained

Existing Public Stormwater Manhole to be Retained

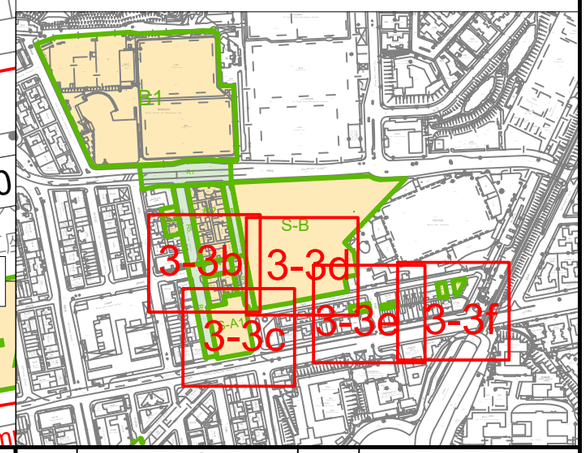
Proposed New Stormwater Pipe

Proposed New Stormwater Manhole

Proposed Stormwater Pipe Upgrade

Proposed Stormwater Manhole Upgrade/Modification

Key Plan
1:8000 @ A3



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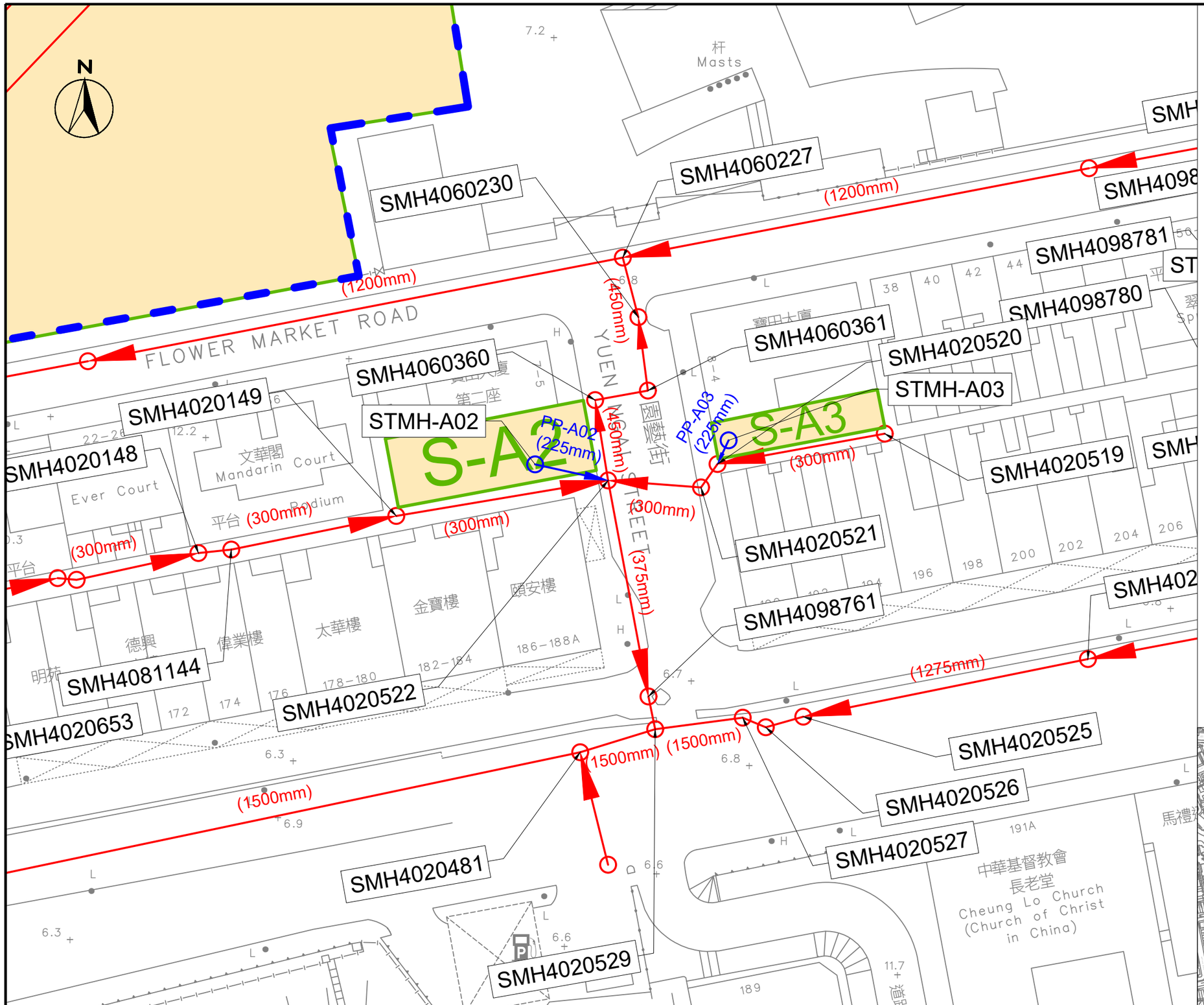
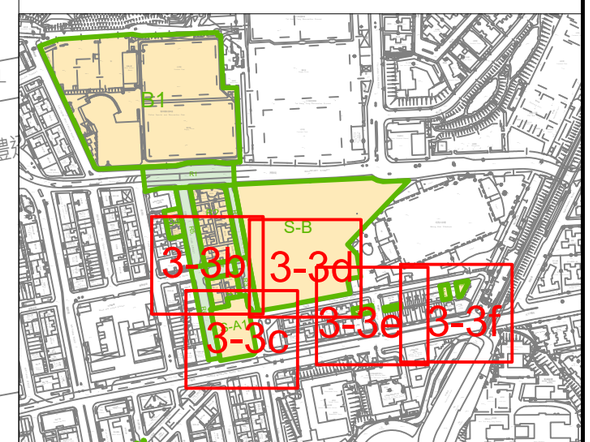
Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority Sai Yee Street/ Flower Market Road Development Scheme

Proposed Stormwater Pipe and Manholes - 3

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-3d
		REV	-



Key Plan
1:8000 @ A3



- Application Boundary
- Stormwater Catchment (Development)
- Stormwater Catchment (Open Area)
- Existing Public Stormwater Pipe to be Retained
- Existing Public Stormwater Manhole to be Retained
- Proposed New Stormwater Pipe
- Proposed New Stormwater Manhole
- Proposed Stormwater Pipe Upgrade
- Proposed Stormwater Manhole Upgrade/Modification

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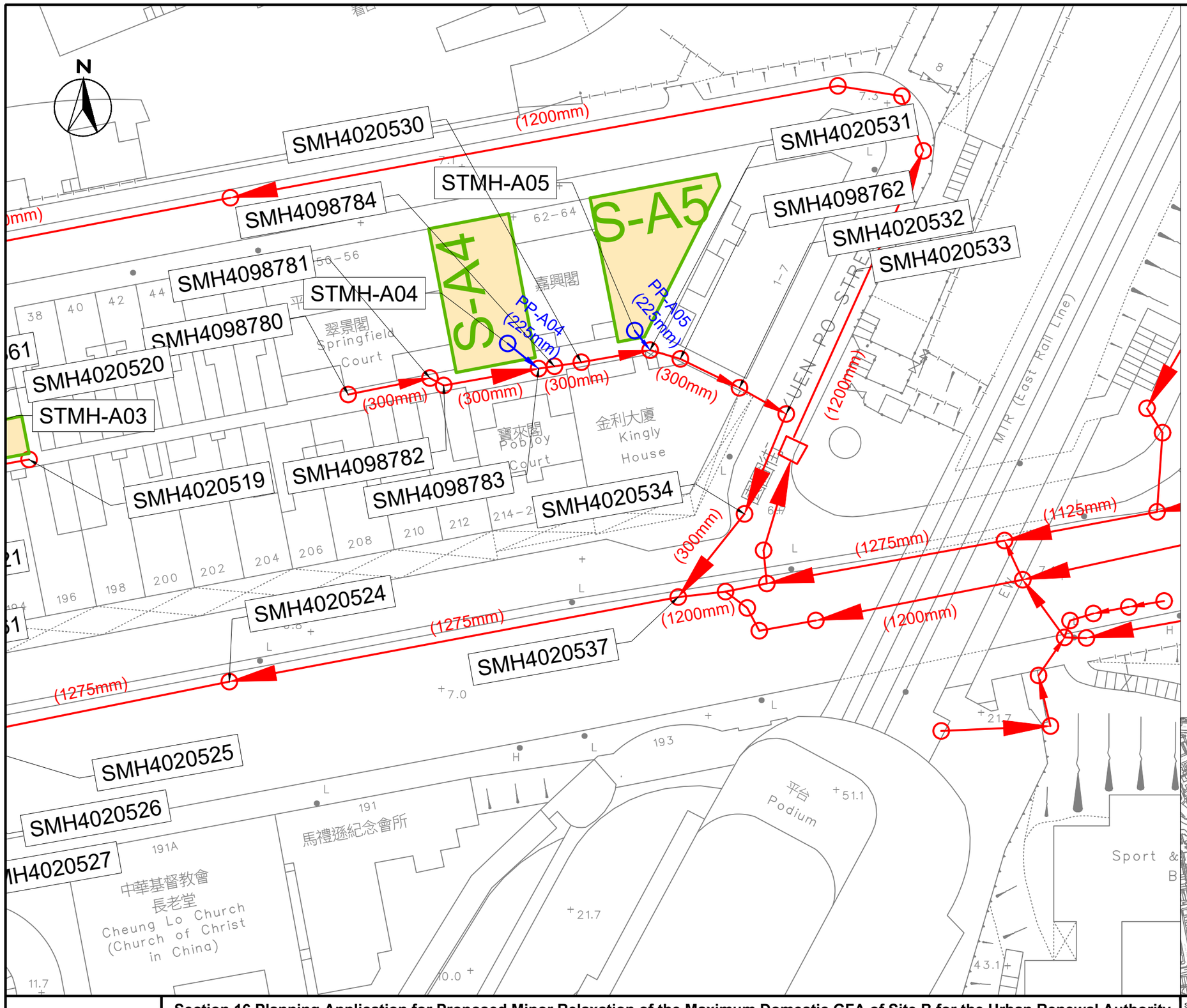
Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority Sai Yee Street/ Flower Market Road Development Scheme

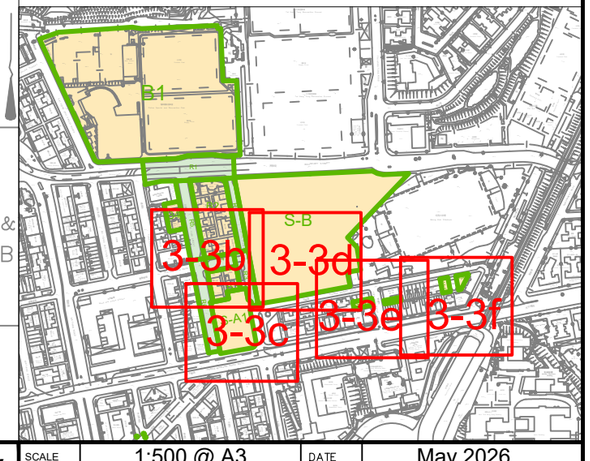
Proposed Stormwater Pipe and Manholes - 4

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-3e
		REV	-



- Application Boundary
- Stormwater Catchment (Development)
- Stormwater Catchment (Open Area)
- Existing Public Stormwater Pipe to be Retained
- Existing Public Stormwater Manhole to be Retained
- Proposed New Stormwater Pipe
- Proposed New Stormwater Manhole
- Proposed Stormwater Pipe Upgrade
- Proposed Stormwater Manhole Upgrade/Modification

Key Plan
1:8000 @ A3



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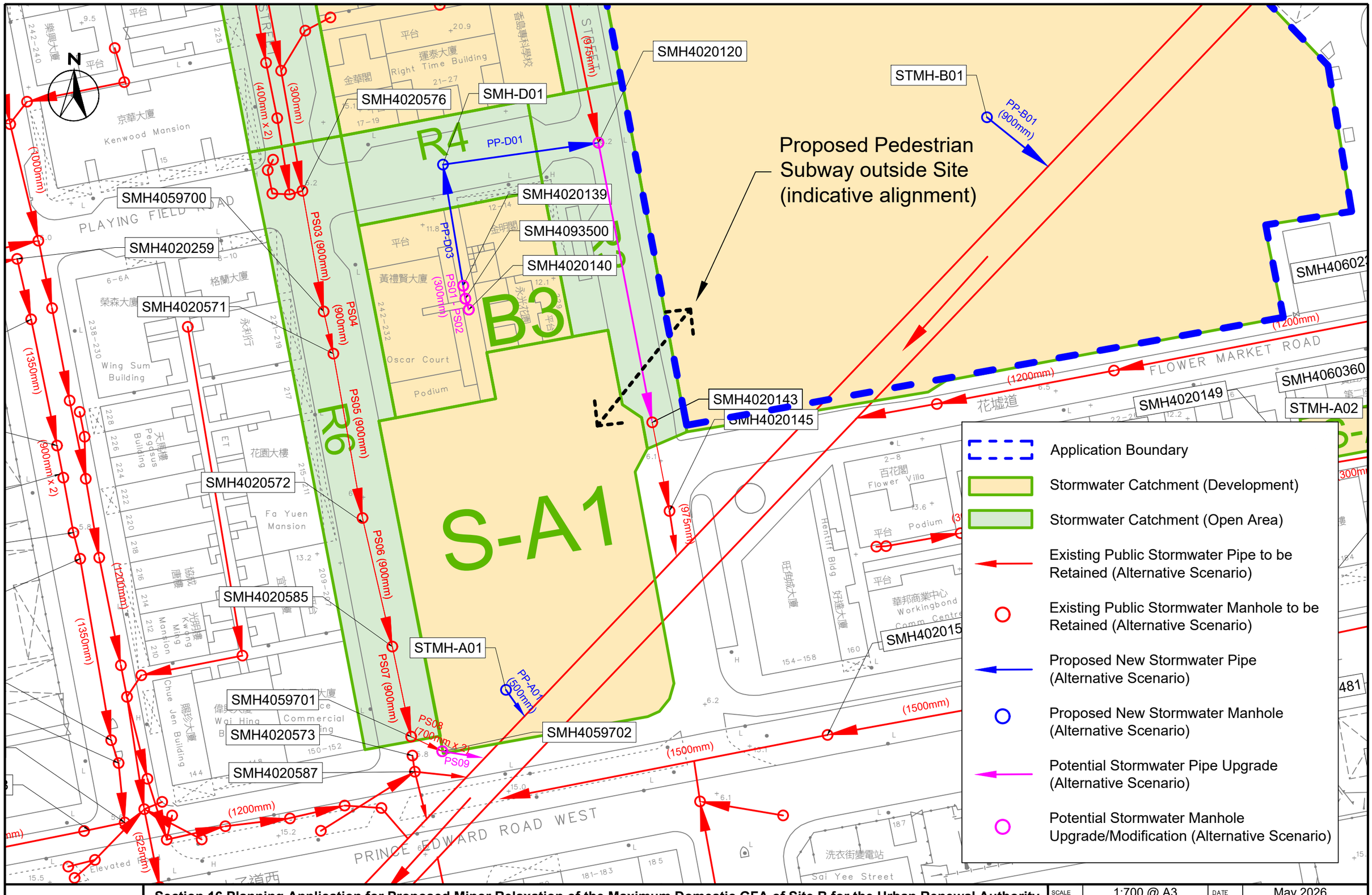
Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority
Sai Yee Street/ Flower Market Road Development Scheme

Proposed Stormwater Pipe and Manholes - 5

SCALE	1:500 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-3f
		REV	-



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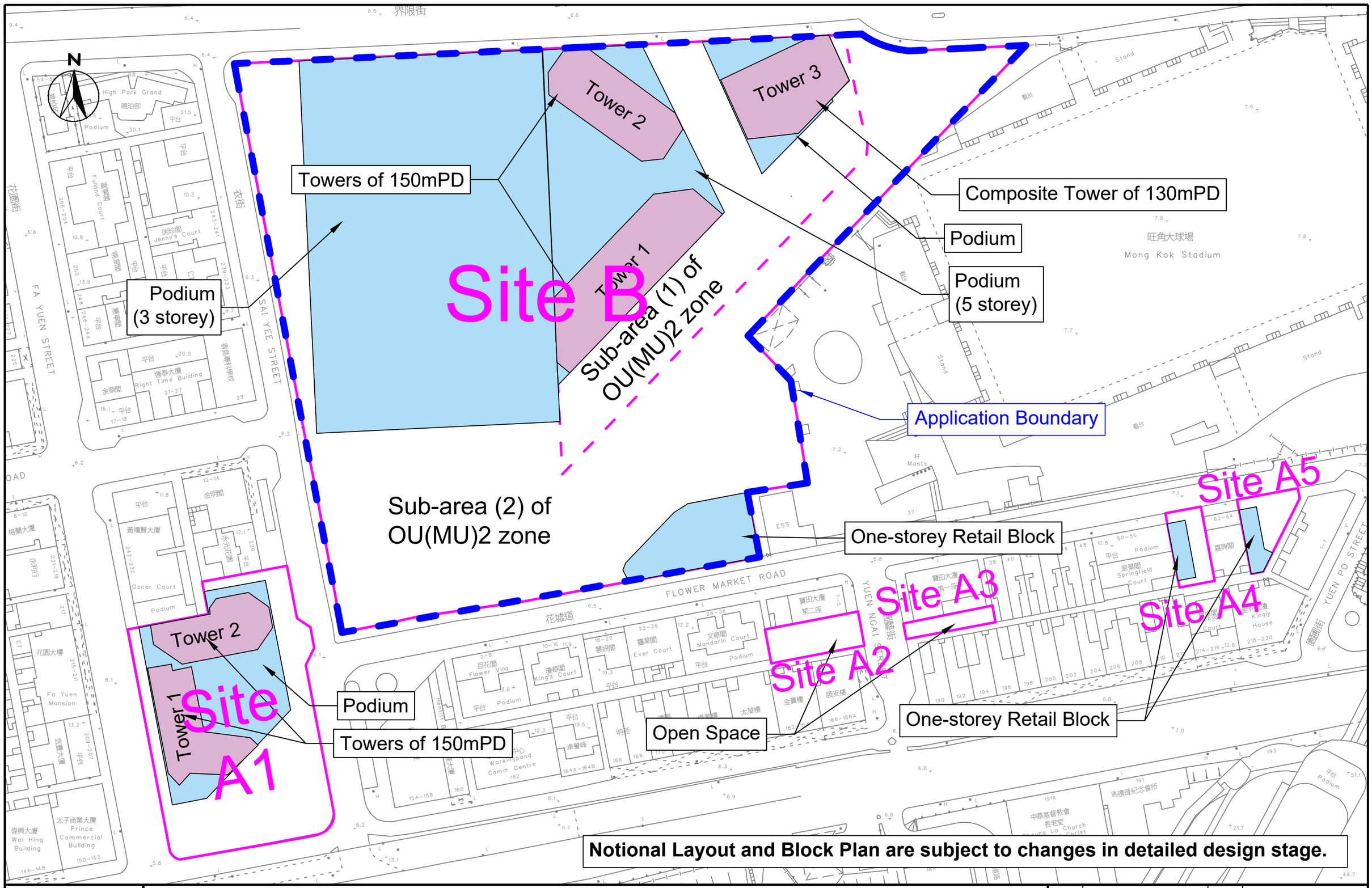
Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority Sai Yee Street/ Flower Market Road Development Scheme

Diversion Route for the Potential Alternative Scenario

SCALE	1:700 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	Fig. 3-4
		REV	-

APPENDIX 2-1
NOTIONAL PLAN OF THE PROPOSED DEVELOPMENT



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Section 16 Planning Application for Proposed Minor Relaxation of the Maximum Domestic GFA of Site B for the Urban Renewal Authority
Sai Yee Street/ Flower Market Road Development Scheme

Notional Plan of the Proposed Development

SCALE	1:1000 @ A3	DATE	May 2026
CHECK	KS	DRAWN	CC
JOB No.	IA25056-S16	DRAWING No.	App. 2-1
		REV	-

APPENDIX 3-1
STORMWATER DISCHARGE FROM CATCHMENT ZONE

Appendix 3-1 - Stormwater Discharge from Catchment Zone

Catchment Zone	S-A1	S-A2	S-A3	S-A4	S-A5	S-B1	B1	B2	B3
Description	Site A1	Site A2	Site A3	Site A4	Site A5	Site B	Existing Development	Existing Development	Existing Development
Catchment Area (m^2)	3570	268	123	233	251	24870	36749	4553	1334
Slope (m per 100m)[1]	2.50	2.50	2.50	2.50	2.50	2.50	0.16	2.50	2.50
L (m)	70.0	17.0	15.0	19.0	19.0	150.0	170.0	52.0	24.0
TOC (min) [3]	3.7	1.2	1.1	1.3	1.3	5.0	5.0	2.7	1.4
Runoff intensity (mm/hr)[2]	253.5	296.6	299.0	294.3	294.3	238.6	238.6	267.8	292.0
Paved area (m^2)	3570	268	123	233	251	24870	19449	4553	1334
Runoff coefficient (paved)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Drainage discharge (L/s)	226.4	19.9	9.2	17.2	18.5	1484.6	1161.0	305.0	97.5
Unpaved area (m^2)[3]	0	0	0	0	0	0	17300	0	0
Runoff coefficient (unpaved)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Stormwater discharge (L/s)	0.0	0.0	0.0	0.0	0.0	0.0	218.0	0.0	0.0
Total Stormwater discharge (L/s)	226.4	19.9	9.2	17.2	18.5	1484.6	1379.0	305.0	97.5
Rainfall increased and design allowance for end of 21st century	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%
Total Stormwater discharge with Rainfall increased (L/s)	290.0	25.5	11.8	22.0	23.7	1901.7	1766.5	390.7	124.9

Note:
[1] A slope of 1:40 is assumed for flat catchment area.
[2] The run-off intensity is calculated by the equation in Section 4.3.3 of the CORRIGENDUM No. 1/2024:

$$i = \frac{a}{(t_d + b)^c}$$

where Table 3a - Storm Constants for 50years return period of HKO Headquarters are adopted.

a = 505.5
b = 3.29
c = 0.355

[3] The time of Concentration (TOC) has been capped to 5 minutes.

Appendix 3-1 - Stormwater Discharge from Catchment Zone

Catchment Zone	B4	R1	R2	R3	R4	R5	R6
Description	Existing Development	Paved Road	Paved Road	Paved Road	Paved Road	Paved Road	Paved Road
Catchment Area (m^2)	725	3595	1180	1199	699	1965	2064
Slope (m per 100m)[1]	2.50	0.20	0.15	0.15	0.15	0.57	0.16
L (m)	20.0	28.0	16.0	20.0	20.0	20.0	20.0
TOC (min) [3]	1.2	2.5	1.7	2.1	2.2	1.5	2.0
Runoff intensity (mm/hr)[2]	296.6	271.0	285.7	278.0	276.2	289.9	279.8
Paved area (m^2)	725	3595	1180	1199	699	1965	2064
Runoff coefficient (paved)	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Drainage discharge (L/s)	53.8	243.8	84.3	83.4	48.3	142.5	144.5
Unpaved area (m^2)[3]	0	0	0	0	0	0	0
Runoff coefficient (unpaved)	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Stormwater discharge (L/s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Stormwater discharge (L/s)	53.8	243.8	84.3	83.4	48.3	142.5	144.5
Rainfall increased and design allowance for end of 21st century	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%	28.1%
Total Stormwater discharge with Rainfall increased (L/s)	68.9	312.3	108.0	106.8	61.9	182.6	185.1

APPENDIX 3-2
DETAILED CALCULATION OF PIPE UTILIZATION

Appendix 3-2 - Detailed Calculation of Pipe Utilization

Table A -Existing Pipes

Pipe No.	Upstream Manhole No.	Downstream Manhole No.	Upstream invert level (mP.D.) [3]	Downstream invert level (mP.D.) [3]	Length (m)	Diameter (m)	Area (m^2)[2]	Hydraulic Radius (m)	Slope	Kinematic Viscosity (m^2/s)	Hydraulic Pipeline Roughness (m) [1]	Velocity (m/s)	Full Capacity (L/s)	Catchment	Peak Flow (L/s)	% of full capacity
Existing Pipes																
PS01	SMH4020140	SMH4093500	4.74	4.75	2.3	0.225	0.036	0.056	-0.006	1.14E-06	0.003	-	-	B3	124.9	-
PS02	SMH4093500	SMH4020139	4.75	4.77	2.6	0.225	0.036	0.056	-0.006	1.14E-06	0.003	-	-	B3	124.9	-
PS03	SMH4020576	SMH4059700	3.94	3.90	24.7	0.900	0.573	0.225	0.002	1.14E-06	0.006	0.93	531.1	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	623%
PS04	SMH4059700	SMH4020571	3.90	3.87	8.7	0.900	0.573	0.225	0.003	1.14E-06	0.003	1.50	858.4	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	385%
PS05	SMH4020571	SMH4020572	3.85	3.82	33.6	0.900	0.573	0.225	0.001	1.14E-06	0.006	0.69	393.8	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	840%
PS06	SMH4020572	SMH4020585	3.82	3.74	26.6	0.900	0.573	0.225	0.003	1.14E-06	0.003	1.40	802.5	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	412%
PS07	SMH4020585	SMH4059701	3.74	3.70	18.5	0.900	0.573	0.225	0.002	1.14E-06	0.006	1.07	612.8	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	540%
PS08 (Single Pipe)	SMH4059701	SMH4059702	2.57	2.55	6.9	0.700	0.346	0.175	0.003	1.14E-06	0.006	1.05	363.5	#N/A	#N/A	-
PS08	SMH4059701	SMH4059702	PS08 consist of two pipes										727.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	455%
PS09 (Single Pipe)	SMH4059702	to Nullah	2.55	2.54	8.1	0.700	0.346	0.175	0.001	1.14E-06	0.006	0.68	236.9	#N/A	#N/A	-
PS09	SMH4059702	to Nullah	PS09 consist of two pipes										473.8	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	698%

Note:
[1] The roughness coefficient for slime concrete sewer under poor condition is adopted; the ks values are 3mm for velocities greater than 1.2m/s, otherwise 6mm.
[2] According to Section 9.3 of Stormwater Drainage Manual (Fifth Edition), the effect of sedimentation should be estimated by 10% reduction in flow area.
[3] Highlighted invert levels are estimated values.
[4] The flow direction of PS01 to PS02 have been reversed based on the planned configuration instead of the existing configuration.

Appendix 3-2 - Detailed Calculation of Pipe Utilization

Table B - Proposed New Pipe

Pipe No.	Upstream Manhole No.	Downstream Manhole No.	Upstream invert level (mP.D.)	Downstream invert level (mP.D.)	Length (m)	Diameter (m)	Area (m^2)[2]	Hydraulic Radius (m)	Slope	Kinematic Viscosity (m^2/s)	Hydraulic Pipeline Roughness (m) [1]	Velocity (m/s)	Full Capacity (L/s)	Catchment	Peak Flow (L/s)	% of full capacity
Proposed New Pipe [3]																
PP-A01	STMH-A01	to Nullah	--	--	--	0.500	0.177	0.125	0.020	1.14E-06	0.0003	3.33	588.1	S-A1	290.0	49%
PP-A02	STMH-A02	SMH4020522	--	--	--	0.225	0.036	0.056	0.020	1.14E-06	0.0003	2.02	72.2	S-A2	25.5	35%
PP-A03	STMH-A03	SMH4020520	--	--	--	0.225	0.036	0.056	0.020	1.14E-06	0.0003	2.02	72.2	S-A3	11.8	16%
PP-A04	STMH-A04	SMH4098783	--	--	--	0.225	0.036	0.056	0.020	1.14E-06	0.0003	2.02	72.2	S-A4	22.0	30%
PP-A05	STMH-A05	SMH4020531	--	--	--	0.225	0.036	0.056	0.020	1.14E-06	0.0003	2.02	72.2	S-A5	23.7	33%
PP-B01	STMH-B01	to Nullah	--	--	--	0.900	0.573	0.225	0.020	1.14E-06	0.0003	4.78	2735.8	S-B1	1901.7	70%
PP-D01	SMH4020120	SMH-D01	2.90	2.85	31.6	1.700	2.043	0.425	0.0016	1.14E-06	0.0003	1.96	3998.0	B1, B2, R1, R2, R3	2684.3	67%
PP-D02	SMH-D01	SMH4020576	2.85	2.80	28.8	1.700	2.043	0.425	0.0017	1.14E-06	0.0003	2.05	4192.4	B1, B2, B3, R1, R2, R3, R4	2871.1	68%
PP-D03	SMh4020139	SMH-D01	3.20	2.85	24.7	0.400	0.113	0.100	0.0142	1.14E-06	0.0003	2.43	275.2	B3	124.9	45%

Note:
[1] The roughness coefficient for slime uPVC sewer under poor condition is adopted; the ks values are 0.3mm for velocities greater than 1.2m/s, otherwise 1.5mm.
[2] According to Section 9.3 of Stormwater Drainage Manual (Fifth Edition), the effect of sedimentation should be estimated by 10% reduction in flow area.
[3] The details of the Proposed Pipe subject to change.
[4] Proposed changes are bold-underlined.

Appendix 3-2 - Detailed Calculation of Pipe Utilization

Table C - Proposed Upgrade Pipe

Pipe No.	Upstream Manhole No.	Downstream Manhole No.	Upstream invert level (mP.D.)	Downstream invert level (mP.D.)	Length (m)	Diameter (m)	Area (m^2)[2]	Hydraulic Radius (m)	Slope	Kinematic Viscosity (m^2/s)	Hydraulic Pipeline Roughness (m) [1]	Velocity (m/s)	Full Capacity (L/s)	Catchment	Peak Flow (L/s)	% of full capacity
Proposed Upgrade Pipe [3][4]																
PS01	SMH4020140	SMH4093500	4.74	**4.60**	2.3	**0.300**	0.064	0.075	0.061	1.14E-06	0.0003	4.24	269.8	B3	124.9	46%
PS02	SMH4093500	SMH4020139	**4.60**	**4.50**	2.6	**0.300**	0.064	0.075	0.038	1.14E-06	0.0003	3.34	212.2	B3	124.9	59%
PS03	SMH4020576	SMH4059700	**2.80**	**2.75**	24.7	**1.700**	2.043	0.425	0.002	1.14E-06	0.0003	2.21	4522.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	73%
PS04	SMH4059700	SMH4020571	**2.75**	**2.73**	8.7	**1.700**	2.043	0.425	0.002	1.14E-06	0.0003	2.21	4522.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	73%
PS05	SMH4020571	SMH4020572	**2.73**	**2.66**	33.6	**1.700**	2.043	0.425	0.002	1.14E-06	0.0003	2.21	4522.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	73%
PS06	SMH4020572	SMH4020585	**2.66**	**2.61**	26.6	**1.700**	2.043	0.425	0.002	1.14E-06	0.0003	2.21	4522.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	73%
PS07	SMH4020585	SMH4059701	**2.61**	**2.57**	18.5	**1.700**	2.043	0.425	0.002	1.14E-06	0.0003	2.21	4522.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	73%
PS08	SMH4059701	SMH4059702	**2.57**	**2.56**	6.9	**1.700**	2.043	0.425	0.002	1.14E-06	0.0003	2.21	4522.0	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	73%
PS09 (Single Pipe)	SMH4059702	to Nullah	**2.56**	**2.485**	8.1	**0.750**	0.398	0.188	0.009	1.14E-06	0.0003	2.90	1151.4	#N/A	#N/A	-
PS09	SMH4059702	to Nullah	PS09 consists of **four** pipes										4605.4	B1, B2, B3, B4, R1, R2, R3, R4, R5, R6	3307.6	72%

Note:
[1] The roughness coefficient for slime uPVC sewer under poor condition is adopted; the ks values are 0.3mm for velocities greater than 1.2m/s, otherwise 1.5mm.
[2] According to Section 9.3 of Stormwater Drainage Manual (Fifth Edition), the effect of sedimentation should be estimated by 10% reduction in flow area.
[3] The details of the Proposed Pipe subject to change.
[4] Proposed changes are bold-underlined.